

# FOLK USE OF ELEMENTAL MERCURY: A POTENTIAL HAZARD FOR CHILDREN?

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Human beings have used elemental mercury (also known as metallic mercury) for thousands of years. Early ignorance of its potential toxicity resulted in devastating adverse effects, including neurodevelopmental and behavioral deficits among exposed persons. These adverse effects most commonly resulted from exposure to the vapor of elemental mercury. Recognition of the toxicity of elemental mercury has led to strict regulation of its use in occupational settings. (*J Natl Med Assoc.* 2001;93:320-322.)

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Children are especially at risk for the deleterious effects of elemental mercury. Generally, the younger the brain, the greater the adverse effects of mercury. In addition, elemental mercury being heavier than air tends to settle near the floor and leads to increased exposure of young children. Moreover, because children have higher minute volume respirations than adults, they inhale more air and consequently more mercury vapor. Also, children are fascinated by the sight of spilled elemental mercury and tend to play with it, resulting in further vaporization of the metal. The end result is inhalation of larger amounts of vapor. Thus, for any given dose of elemental mercury exposure, children often attain much higher body concentrations of mercury than adults.<sup>1,2</sup> Chronic exposure to elemental mercury in children results in neurodevelopmental and neurobehavioral alterations, including loss of motor abilities, loss of language skills, apathy, agitation,

withdrawn mood, loss of social skills, and personality changes.<sup>2,3</sup>

Health care providers should be aware of published reports suggesting that inner-city minority populations may be at increased risk of elemental mercury exposure. Specifically, concern has been raised about the ritualistic uses of mercury among Latino and African-Caribbean populations.<sup>4-6</sup> In some segments of the Latino and African-Caribbean cultures, elemental mercury is believed to have enormous spiritual and magical powers. Elemental mercury, sometimes called *azogue*, is used as a folk remedy for protection from harm. In addition, it is believed to be a catalyst for the attraction of good health, wealth, happiness, and successful interpersonal relationships. Mercury for these purposes is generally sold in folk pharmacies known as *Botanicas*, which are outlets that specialize in selling religious items used by practitioners of several spiritual belief systems, including *espiritismo*, *Santeria*, and voodoo. Botanicas also sell herbs used in folk medicine and for general health promotion. The reported ways of using mercury include burning in a candle and sprinkling on the floors at home. Of concern is the fact that large quantities of mercury vapor can be volatilized by candle burning. Additionally, elemental mercury intentionally spilled in a home can persist in the flooring for several weeks to months, thereby creating an environment of

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chronic vapor exposure for current residents as well as future occupants.

In 1990, a report of a telephone survey conducted in 13 cities with large Hispanic populations indicated that 99 of 115 Botánicas sold mercury to the general public.<sup>4</sup> In December 1992, the California Department of Health Services conducted an investigation of metallic mercury sales by Botánicas in the Los Angeles area and discovered that this practice may be widespread among communities of Caribbean and Hispanic origin. According to the Environmental Protection Agency, the mercury was obtained from a metal recycler, repackaged, and redistributed to small business establishments such as Botánicas.<sup>7</sup> Another survey conducted in 1993 by the Connecticut Department of Public Health Services and Addiction Services found that 80% of interviewed Hispanic and West Indian spiritist folk healers used mercury and were largely unaware of the toxic dangers of its use.<sup>8</sup> The Chicago Department of Health visited 16 Botánicas in the local Hispanic community in 1997, all of which sold mercury.<sup>9</sup> In their simultaneous survey of 79 Hispanic Chicago, Illinois residents, half reported that they knew someone outside of the family who used mercury and one fourth knew someone within the family who used mercury. Forty-nine percent reported that they had either used mercury or visited a Botánica.<sup>9</sup> In a 1999 survey of 203 adults of Latin American and Caribbean extraction in New York City,<sup>10</sup> 54% reported that they used mercury in religious or ethnic practices.

In 1995, we conducted a study of Botánicas in New York City.<sup>5</sup> We inquired from store personnel about the cost, sales, uses, and purchases of mercury. We found that nearly 93% of Botánicas sold mercury gelatin capsules daily, at an average cost of \$1.50 per capsule. Forty-nine percent of Botánicas sold one to four capsules daily, 30% sold five to ten capsules daily, and 7.3% sold eleven or more capsules daily. Botánica personnel reported that Puerto Ricans, Dominicans, and other Hispanics make up about 90% of mercury buyers and that more than two-thirds of buyers were women. We discovered that prescribers of mercury often included family members, *Santeros* (*Santería* priests), card readers, and spiritualists. We learned that because mercury flows smoothly, it provides good luck, whereas its liquid nature prevents evil from sticking to the person. Mercury was recommended 78% of the time for luck in love, money, work, and health, and 56%

of the time for protection against evil. There were several reported methods for mercury use. Forty-nine percent of the time mercury was carried in a sealed pouch, but 29.2% of the time it was sprinkled in the home. The rest of the time mercury was burnt in a candle, boiled in a pot, or swallowed.

A recent report published in June 2000 described a case report of metallic mercury poisoning involving nine children and their mother.<sup>11</sup> The source of exposure in this report was a vial of metallic mercury taken from the home of a neighbor who operated a business preparing mercury-filled amulets for practitioners of *Santería*. Mercury levels in the children were in a very high toxic range and all the children required medical treatment. This recent case report provides even further reason for concern.

Inner-city children are disproportionately diagnosed as having learning disabilities, emotional disturbances, hyperactivity disorders, attention deficits, behavioral disorders, and other mental health problems—all of which are consistent with mercury toxicity. Given the social and economic disadvantages faced by children residing in the inner city, mercury toxicity could be a very important and potentially preventable contributor to these problems. Published reports have demonstrated significant associations between poorer cognitive/developmental functioning and low socioeconomic status, inner-city residence, and minority status. Kramer et al., in examining a national cohort from the National Health and Nutrition Examination Survey (NHANES), reported that lower income, minority status, and lower education of an adult reference person were independently associated with poorer performance on cognitive tests.<sup>12</sup> Neurodevelopment has also been correlated with low income and minority status.<sup>13,14</sup> Blood lead levels from the NHANES III were found to be consistently higher in younger children, African Americans, inner-city residents, and low-income families.<sup>15</sup> Mercury, like lead, produces neurodevelopmental deficits in children. If present in the local environment it may be a contributing factor to the deficits observed in inner-city, minority children. Health care providers should be aware of this potential danger.

In conclusion, it should be noted that for the practitioners, spiritualism provides an essential and indigenous source of community support, community socialization, and extrafamilial mental health intervention. Thus, the potential dangers of ele-

mental mercury exposure need to be sensitively separated from the enormous social-psychological benefits of spiritualism.

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